

WHAT IS CLAIMED IS:

1. An ultrasound probe which scans a subject with beams of ultrasound transmitted by a moving transducer comprising:

5 a fluid-filled chamber having a main compartment in which the transducer is movably mounted;

a secondary compartment of the fluid-filled chamber;

10 a fluid-filled passageway connecting the main and secondary compartments; and

a drive mechanism extending into the fluid-filled chamber which supplies a motive force for the transducer, the drive mechanism passing through the secondary compartment and terminating in the main compartment of the fluid-filled chamber.

2. The ultrasound probe of Claim 1, wherein the drive mechanism further comprises a drive shaft.

20 3. The ultrasound probe of Claim 2, further comprising a motor, located outside the fluid-filled chamber and coupled to the drive shaft for oscillating or rotating the drive shaft.

25 4. The ultrasound probe of Claim 2, further comprising a secondary seal by which the drive shaft passes from outside the fluid-filled chamber into the secondary compartment, and a primary seal by which the drive shaft passes from the secondary compartment to the main compartment.

30 5. The ultrasound probe of Claim 4, wherein the seals comprise dynamic seals permitting drive shaft motion.

6. The ultrasound probe of Claim 5, further comprising fluid located on both sides of the primary seal and fluid located on only one side of the
5 secondary seal,

wherein leakage of the secondary seal may admit air into the secondary compartment.

10 7. The ultrasound probe of Claim 1, wherein the fluid-filled passageway further comprises a bubble trap tube.

15 8. The ultrasound probe of Claim 7, wherein the bubble trap tube further comprises a tube extending from a wall dividing the main and secondary compartments into the secondary compartment.

20 9. The ultrasound probe of Claim 1, wherein the transducer comprises an array transducer which may be controlled to electronically steer beams over a planar region,

wherein motion of the array transducer causes the beams to be swept over a volumetric region.

25 10. The ultrasound probe of Claim 9, wherein the transducer is movably mounted on a pivoting mechanism which permits the array transducer to be oscillated back and forth in the elevation direction,
wherein oscillation of the pivoting mechanism is
30 motivated by the drive mechanism.

35 11. The ultrasound probe of Claim 10, wherein the drive mechanism further comprises a drive shaft connected to the pivoting mechanism by a gear mechanism.

12. The ultrasound probe of Claim 9, wherein
the fluid-filled chamber is enclosed by an acoustic
window through which ultrasound beams are transmitted
5 as the array transducer is moved.

13. The ultrasound probe of Claim 12, further
comprising a fluid-filled space located between the
transmitting surface of the array transducer and the
10 acoustic window as the array transducer is moved.

14. An ultrasound probe which scans a subject
with beams of ultrasound transmitted by a moving
transducer comprising:

15 a fluid-filled chamber having a main compartment
in which the transducer is movably mounted;

a secondary compartment of the fluid-filled
chamber;

20 a fluid-filled passageway connecting the main
and secondary compartments; and

a drive mechanism terminating in the main
compartment which supplies a motive force for the
transducer,

25 wherein the main compartment exhibits an
interior surface which promotes the travel of bubbles
in the main compartment toward the fluid-filled
passageway, and wherein the secondary compartment
exhibits an interior surface which promotes the
travel of bubbles in the secondary compartment away
30 from the fluid-filled passageway.

15. The ultrasound probe of Claim 14, wherein
the fluid-filled passageway is located at or near the
center of the fluid-filled chamber.

16. The ultrasound probe of Claim 14, wherein the fluid-filled passageway further comprises a bubble trap tube.

· 5 17. The ultrasound probe of Claim 14, wherein the transducer comprises an array transducer which may be controlled to electronically steer beams over a planar region,

10 wherein motion of the array transducer causes the beams to be swept over a volumetric region.

18. The ultrasound probe of Claim 14, wherein the drive mechanism is coupled to a motor located outside the fluid-filled chamber.

15 19. The ultrasound probe of Claim 18, wherein the drive mechanism comprises a drive shaft.

20. The ultrasound probe of Claim 19, wherein the drive mechanism further comprises a gear mechanism.